

What is claimed is:

1. A method for measuring the presence or absence of phosphate groups attached to biological molecules in a sample, whereby these molecules are tagged with fluorescent markers and these fluorescent markers are activated by means of irradiating the sample with light, **wherein** the method encompasses the following steps:
 - a) Use of a fluorescent marker, the fluorescence lifetime of which assumes a different value depending upon the presence or absence of phosphate groups attached to the biomolecule;
 - b) Measurement of the fluorescence lifetime of the fluorescent marker attached to a biomolecule and selected in accordance with Step a);
 - c) Classification of the biomolecules in accordance with the presence or absence of phosphate groups attached to these, based on the different lifetime of each.
2. The method of Claim 1, **wherein** the biological molecules are selected from a group which comprises an amino acid sequence, such as proteins, peptides, glycoproteins and lipoproteins.
3. The method of Claim 1, **wherein** the fluorescent marker is selected from the group which comprises fluorescein and fluorescein derivatives.
4. The method of Claim 1, **wherein** the biological molecules of a sample are incubated with a phosphatase or with a phosphokinase prior to the measurement of the state of phosphorylation.
5. The method of Claim 1, **wherein** one or more steps selected from the group of marking of biological molecules, activation of the assay, and measurement of the fluorescence lifetime is conducted in a multiwell plate, such as a microplate with 96, 384 or 1536 wells and with a computer for automatically classifying the biomolecules or the samples respectively.

6. The method of Claim 1, **wherein** the measurement of the fluorescence life-time is undertaken by means of time correlated single photon counting (TCSPC) or by means of the phase modulation technique.
- 5 7. The method of Claim 1, **wherein** the proportion of the two species of biomolecules in the assay is quantified by means of calibration.
8. Use of the method in accordance with one or several of the Claims 1 to 7 for drug discovery screening of chemical agents for pharmacologically effective
10 substances
9. Use of the method in accordance with one or several of the Claims 1 to 7 for drug discovery screening of chemical agents for manufacturing pharmacological preparations.
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10. Use of the method in accordance with one or several of the Claims 1 to 7 for detecting defects in human or animal enzymes.
11. Use of the method in accordance with one or several of the Claims 1 to 7 for
20 detecting a reaction involving enzymes from one of the Classes I-VI.
12. Use of the method in accordance with one or several of the Claims 1 to 7 for quantifying a reaction involving enzymes from one of the Classes I-VI.